Game Changing Development

3D-MAT

Completed Technology Project (2012 - 2015)

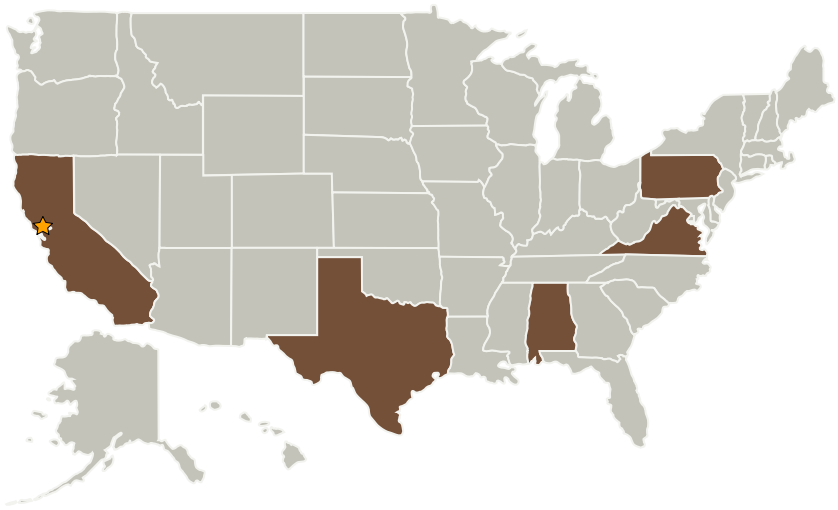
Project Introduction

3D MAT is developing a robust multi-functional material for use in spacecraft heatshields. The 3D-woven composite has pushed state of the art manufacturing to new levels yielding tailored materials that can be both structure and thermal protection system. The unique structural heat shield material is enabling future Orion missions to take humans far into the solar system.

Anticipated Benefits

The objective of this task is to test and characterize the innovative 3D Woven TPS design concepts. These concepts appear to be viable candidates for next generation entry vehicle heatshield applications and have the potential to match legacy carbonphenolic TPS performance at half the real weight over a broad range of trajectories, representing "game-changing" performance. The task is expected to advance the technology readiness level (TRL) of the technology through arc jet testing and characterization to evaluate material performance, particularly in testing the joints, increased acreage, and types of needled 3D architectures.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
Alabama	California
Pennsylvania	Texas
Virginia	

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

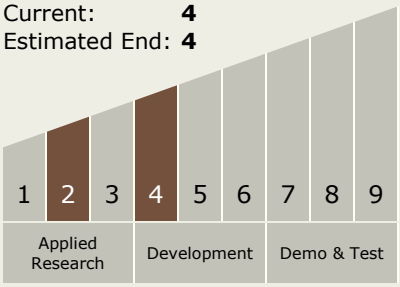
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
Ethiraj Venkatapathy

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Target Destinations

Earth, The Moon, Mars